

**ABSTRACT OF THE DISCLOSURE**

A parasiticidal pellet system which delivers both immediate and long term control of parasite infestation in an animal as part of a single implant procedure. The system includes an implanter apparatus for subcutaneously implanting parasiticidal pellets in an animal through the bore of a hypodermic needle which is operably coupled to a pellet magazine, and a plurality of pellets sized to be implanted through the needle and positioned in the magazine for selective alignment of a pellet with the needle. The pellets include at least one immediate release parasiticidal agent first dose pellet and at least one extended release parasiticidal agent dose second pellet. The combined pellets are packaged in the magazine in sequential order for simultaneous delivery of an immediate dose and an extended dose as part of a single injection. The system permits both immediate and sustained release of an effective dose of the parasiticidal agent, in order to control present parasite infestation and to prevent reinfection for a period of up to about 150 days.